

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Chicago, Illinois

Vol. VI No. 3

January 19, 1972

Price: \$9/year

Independent Disk System User Is Satisfied Customer

By Denay Goss
CW Correspondent

Just how good are the much publicized replacements for IBM's 2314 and the independents' double density disk storage systems? Very good, and in many cases better than the IBM units, a recent survey revealed.

Surveyed were users in banking, finance and insurance, from colleges, government, and firms in manufacturing, research and service.

The organizations using equipment from Apple, Calcomp, Marshall Data Systems, Memorex, Potter and Telex. Almost all selected the equipment primarily for its price advantage over comparable IBM units, and all carefully investigated service available

before making a decision. Several said the decision paved the way for the use of more independent peripherals.

A Calcomp user, for example, conducted detailed studies comparing Calcomp equipment with the

Spotlight Survey

2314. The major advantage of the Calcomp system, reported in 40% less cost in the advantage that, when combined with a printer, is a good recommendation for the independent equipment.

A spokesman for the user said the lower price alone means an annual savings of \$80,000 to \$120,000. The

increased performance would mean still more savings. The Torrington Manufacturing Co. of Torrington, Conn., is a user of Marshall Data Systems' replacement units and has them interfaced to a 360/40 along with the 2314.

Robert Manion, the firm's manager of computer operations, reported that the Marshall equipment may be more error prone, but errors are more recoverable than those that turn up in the 2314. He added that he has no measurement of the performance of the two systems but believes that over a like period of time, the Marshall equipment might be better than the 2314.

University Microfilm, a division of Xerox in Ann

(Continued on Page 4)



Environment Control

A process control system to monitor and control all of the environmental systems of a local store was displayed at the 61st Annual Convention of the National Retail Merchants Association. The system, based on an IBM System 7, controls all the functions of a store including turning on and shutting off the electricity. It also monitors fire detection and security control sensors. (Story on Page 3)

\$10 Million System

Mass. Readies DP Welfare Plan

By Edward J. Brade
Of the CW Staff

BOSTON — It's back to the drawing board for the Massachusetts Welfare Department computer system, but local observers are optimistic about the \$10 million, two-year plan can work.

Development of the department's computer system has been fraught with errors, delays and cost overruns in the four years since the state took over the welfare function from municipalities.

The computer system is the recommendation of a new internal study which proposes spending \$7.8 million to develop a centralized financial manage-

ment control system and to lease still-unselected hardware.

While the report also suggests that annual maintenance of the system would cost \$3.8 million, Welfare Department employees reported that adequate provisions were made to absorb the welfare benefit when the number of eligible families were denied these benefits.

A recent report claimed errors were being made in 40% of the state's welfare cases, either in

giving too much or too little, or in denying or granting benefits to inappropriate recipients.

New Coordinator

There is still no ability to create computerized files of recipients, noted George Eichman, director of the new project at the Management Office (PMO). Eichman, who prepared the new internal report will coordinate the development of the system, if and when it is approved by state and federal agencies.

One of the first steps, however, must be to standardize local forms and procedures in field offices, Eichman told CW last week.

(Continued on Page 4)

Support for DOS/360 to End; IBM Aims Enhancements at 370

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. — DOS/360 users will be on their own by April 1973.

Release 26 is the last release of the Disk Operating System that can be run on an IBM 360 equipment. And March 1, 1973, is the last date on which users can expect to receive no-charge support for Release 26.

IBM spokesmen added that future enhancements to DOS will be directed towards the IBM 370. DOS Release 27, scheduled for the end of May, 1972, will be the first DOS release to operate exclusively on the newer line of products.

The techniques utilized by Release 27 take advantage of 370 hardware and prevent its use on 360, the company said.

Thus the long-anticipated move by IBM to withdraw its support for DOS/360 is finally under way and users apparently have

some 14 months in which to decide how they will cope with the new situation.

That time frame may be a mirage, however, since IBM has said that "the possibility does exist that independent components of Release 26 may be reclassified from Class A to Class C support prior to March 1973.

Some DOS/360 users have

adopted a wait-and-see attitude about the loss of support for their operating systems, but one, George Belles of Colt-Crucible, Syracuse, N.Y., sees the handwriting on the wall. "IBM is moving to the independent user," he says, "to go to OS and acquire more core and a larger installation," or, putting it another way, IBM is saying, "hey, send some money," Belles said.

Independent Vendors

Users may be able to gain functional enhancements for continuous DOS/360 operation through independent software vendors. A spokesman for one such firm, which markets a highly successful enhancement to DOS, noted his company has developed a DOS/360 module that left a hole in its software. He sees no reason why his company should change that policy in the light of IBM's DOS policy.

Some enhancement DOS had been downgraded to Class C before Release 26 became available. The announcement of reclassification of other

(Continued on Page 3)

On the Inside

NRMA Puts On Show
For Retail Users

— Page 3

Special Report: Prospects
Of Future Data Carriers

— Page 8

Communications Will Pace
DP Industry Growth

— Page 25

Communications	12
Computer Industry	25
Editorial	10
Financial	26
Software/Services	13
Systems/Peripherals	19

Developing Nations — Part III

First Priority: Education, Training for Applications

By E. Drake Lundell Jr.

Of the CW Staff

NEW YORK — There are several ways that the United Nations, countries and even individual countries or organizations can help promote the use of computers in developing nations.

The recommendations and conclusions of a recent U.N. survey of the use of computers in developing countries outline the various ways that international action may take to intensify cooperation in the computer field and the role the U.N. can play in promoting that cooperation, especially in the area of the transfer of technology and the training of personnel.

"Education and training for the application of computers to accelerate the process of economic and social development must receive first priority," is the major conclusion drawn by the study.

To meet this need, the study urges the establishment of both national and regional centers to train personnel for the computer field.

Measures should be found, the report says, for creating materials and developing techniques for teaching the effective use of computers and efforts in this area should be supported by the world body and its agencies.

The report notes the problem of training people overseas, i.e., often they are required to leave their country and the development of courses and educational material that can be used in the country embarking on a computer program.

The second major conclusion of the study is that "each developing country needs a broad national policy, consistent with its national goals, on the application of computer technology for development," which would report annually to the U.N.

It urges developing countries to formulate plans containing realistic goals, listed in order of priority, so that orderly short-term and long-term development may take place.

It also urges each developing nation to allocate sufficient resources to implement its master plan for computer use.

The third major conclusion is that "international cooperation needs to be increased in activities relating to the application of computer technology to development."

In this line, the report states that "the Secretary-General believes that the General Assembly may wish to consider... the establishment of an international advisory board on the application of computer technology for development," which would report annually to the U.N.

In addition, the report recommends that "organizations and institutions in developed countries be encouraged to establish 'winning' relationships with organizations in the developing countries and that U.N. programs support such action."

Under the "winning" arrangement, the organization in the developed country would offer its advice and help to the organization in the developing nation in implementing computer-based projects.

The report also recommends that the U.N. call more fully on the international professional organizations for their technical assistance.

The final conclusion of the report states: "Computer technology will increase in importance in the developing countries during the Second United Nations Development Decade and its diffusion and sound application can make a significant contribution in accelerating the rate of their economic and social development."

Therefore, the report says it is important that in the developing countries:

- The analysis and systematic application that occurs when computerization takes place should be recognized in itself as a most significant contribution to improving management decision-making and resource allocation.

- Trade barriers including customs regulations impacting the international movement of equipment, magnetic tapes and cards be minimized.

- Exchange of software and data under appropriate conditions of protection be facilitated and encouraged."

This is the final part of a survey of the role that computers can play in aiding developing nations, and the U.N.'s plans for speeding their application.

"COMPUTER PRINTOUT WAS COSTING US A FORTUNE."

(G. E. Richards, Manager, Data Center, The Goodyear Tire & Rubber Company)



Kodak COM system saved Goodyear \$250,000 on forms alone.

At The Goodyear Tire & Rubber Company's data processing center in Akron, Ohio, nine computers turn out vast quantities of data for their worldwide operations.

To help distribute and utilize this data faster, Goodyear installed a Kodak KOM-90 microfilm system, which converts computer tape data directly to microfilm... at incredible speed. This eliminated the need for 132 printed forms, enough to pay for the computer and microfilm system.

And Goodyear also reports substantial savings in file space and improvements in file integrity and information retrieval.

How much can a Kodak COM system save you? Fill in the coupon and we'll help you find out.

Please send me full details on Kodak KOM microfilmers and their applications.

Name _____ Position _____

Company _____

Address _____

City _____ State _____ Zip _____

Eastman Kodak Company
Business Systems Markets Division
Department DP504, Rochester, N.Y. 14650

For better information management

Kodak Microfilm Systems



Call to the Top Proves the Cure

By a CW Staff Writer

COLUMBUS, Ohio — Having problems with IBM equipment? Try telephoning the company's chairman of the board, C. T. Leason.

C. Donald Curry, Ohio Registrar of Motor Vehicles, did it and worked.

The Ohio Bureau of Motor Vehicles had received its new 370/157 to replace a 360/360, but a number of its internal law enforcement system — more carefully coordinated with the Department of Finance, since its 370 serves as back-up — but could not get it operating.

"We had a lot of downtime," Terry Massaro, the bureau's data conversion manager, stated. "It was a result of power problems and other things."

The downtime meant the bureau was forced further and further behind in updating its traffic conviction and driver license records. Massaro said that working with the IBM sales and service staff did not solve the bureau's problem. Curry explained that he got on the telephone and talked with a man in IBM's office, finally talking with Leason himself. "I told him I was a farm boy from Licking County and that for years I drove cars of one make. I told him that I got a car that didn't work right, and I couldn't get anything done about it. He [Leason] was driving cars of another make ever since."

Curry added that he asked Leason if he knew what he meant. He said Leason assured him he did.

Massaro said that he could not be certain if the bureau's problem would have been solved anyway, but after the telephone call, five customer engineers were assigned to the project, and a sixth IBM employee coordinated their efforts. "The system was up in three days," he said.

Epoch 4's best salesman.



It's the 2420.

New, high-speed hardware has made the computer tape business a whole new ball game.

In fact, some conventional tapes are having a tough time keeping up with the new drives. They're supposed to. But they don't.

Epoch 4 does.

As a result, the 2420 sells a lot of Epoch 4 for us.

But, even if you don't have 2420's, you still need Epoch 4. For two good reasons.

First, Epoch 4 is the best tape you can use, right now, on any transport. Because its coefficient of head wear is less than four per cent of the industry average.

Its modulus of toughness is 80 times greater. And it's the only tape in the business with a twenty-year warranty.

Second, there's the future. Sooner or later, you're going to upgrade to faster transports. 2420's, or something even faster.

Chances are, conventional tape won't perform properly on the new high-speed drives.

So, if you're buying anything less than Epoch 4 right now, your investment may soon be obsolete.

Think it over. Then try Epoch 4. It'll turn your transport into a super salesman.



**GRAHAM
MAGNETICS**

Graham, Texas 76046

ITEL presents the expanding solution to computer system costs.

The expanding solution lies in ITEL's expanding capabilities. We started by offering you the best price/performance lease on the IBM System/360. Your benefits grew as we acquired our disk drive manufacturing capability, Information Storage Systems, developed marketing agreements with Advanced Memory Systems and added System/370 leasing to your options.

Fully committed to the Data Processing Industry, as demonstrated by this ever-expanding line of services, we now offer modern managers the best price performers in the industry, including System 360 or 370 Central Processing Units and the new ITEL 7330 disk subsystem and Monolithic Main Memory, plus the most favorable money savings in the business. And—highly important—the room to improve and expand as better techniques develop.

ITEL can supplant IBM arrangements or upgrade the whole operation, and leave you with substantial annual savings. That is because our financial people are data-processing professionals. Like you, they know that your problem is unique and you know your business best. So, every ITEL solution is tailored to the condition at hand.

A big part of your benefit is that the products we manufacture—an ever expanding line—are at the forefront of technological advancement.

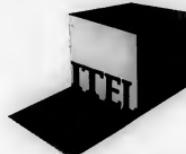
For instance, ITEL's Monolithic Main Memory Extensions, available for both the IBM/360 and 370, are of fourth-generation technology at significant cost savings over IBM prices. (This exceptional add-on is manufactured to our specifications by Advanced Memory Systems, Inc., Sunnyvale California.)

Similarly, the ITEL 7330 disk drive subsystem is plug-to-plug compatible with IBM's 3330 on all IBM System/370's and is actually a whole new level of high-density disk capability, in terms of both speed and capacity. Built by ITEL/Information Storage Systems, it uses standard 3336 disk packs and has 800-million-byte capacity per subsystem.

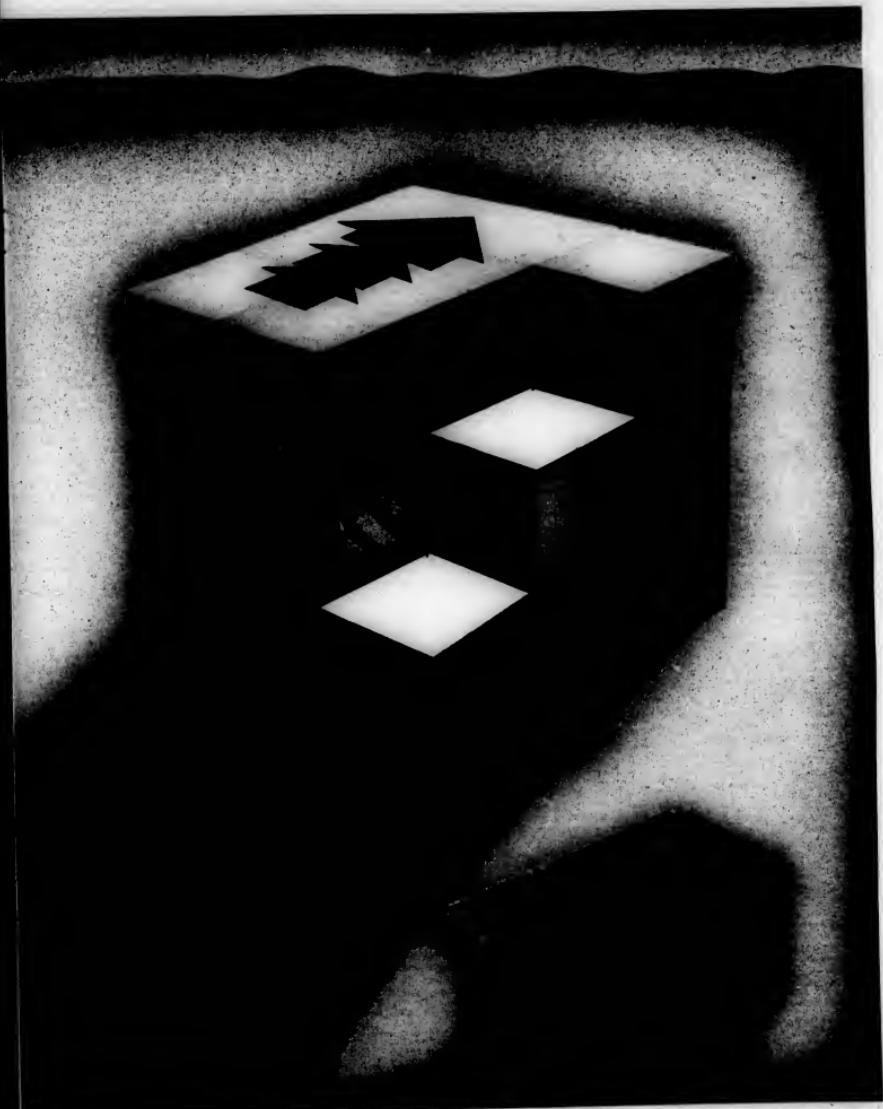
But what about service? ITEL has it. Economically, from a nationwide, on-call staff. A trained, qualified organization, skilled in servicing everything from IBM mainframes to add-on memories, disk drives, and other peripherals.

It comes down to this: ITEL gives you the in-depth experience of data processing and financial professionals. Strong technical capabilities and proven superior products. Follow-on service that means you needn't worry about service. When you are considering any data processing change—new installation, upgrading, or cost change—get in touch with ITEL.

ITEL's people and ITEL's products will show you our expanding solution to today's computer system costs.



ITEL Corporation, DPG, One Embarcadero Center
San Francisco, California 94111, Phone: (415) 989-4220



V
e
l
3
A
x

• Too Many Systems?
How Will Bell React?

Those Great Expectations Of the Future Data Carrier

By Ronald A. Frank
Of the CW Staff

After Microwave Communications Inc. (MCI) broke new ground with its initial Chicago-St. Louis proposal before the FCC, other potential specialized carriers decided the concept had merit.

Although there are currently about 1,960 specialized carrier applications pending before the FCC, the figure is misleading. Each individual tower or a group of towers is classified as a separate application by the commission. Consequently, a large number of tower applications will make up one system filing.



Each future Datran subscriber would use the Digital Communications Console. For example, the first route now being operated by MCI includes 11 individual sites or applications.

Among the 1,960 applications, there are only 100 separate systems which plan to go national or national specialized carrier networks. Some of the larger networks include separate links for individual routes. The proposed MCI coast-to-coast system includes 19 separate regional routes, all of which will be interconnected much like the individual operating companies of the Bell System.

Year to Complete

Even with a start in 1973, most microwave lines will require at least nine months a year to complete construction and testing and begin service to users. Some of the applicants with existing private networks already in operation may be able to reduce this lead time. Datran, which plans to contract its expertise in engineering and providing access to users, estimates it will need several years to build its network.

Significantly, AT&T plans to begin service on its all-digital network early 1974. This date coincides with present Datran plans for new services.

Some of the specialized carrier applicants are already providing non-data services. One of the largest microwave systems now in operation belongs to Western Telecommunications Inc. (WTI), which operates through 13,000 route miles in the West and Midwest through 16 states.

Most of the WTI system is used for non-digital services such as television transmissions, but data services are in the forefront of the specialized carrier offerings being planned. In addition to AT&T's proposed all-digital system at 50 Kbit rates, WTI is also considering store-and-forward operations with front end processors installed at key traffic centers.

New Link

The company is currently completing a new link in the Oregon-Washington area that will have a two-way transmission capability to handle digital traffic. WTI is expected to use this new link as a proving ground for its digital services in anticipation of FCC approval for its specialized carrier applications.

With its buildings, antennas and towers already in place along much of its proposed specialized carrier routes, WTI ex-

pects to cut its construction costs and time compared to some of its competitors. "It's simply a matter of installing additional microwave transmitters and adding more antennas," according to Doug Johnson, director of WTI's commercial department.

WTI has filed a proposed data tariff that includes more than 90 digital service offerings, Johnson said. Several other specialized carriers have filed similar services after the WTI proposal, he said. The company expects to receive FCC approval soon for first services to users beginning before the end of the year.

One specialized carrier applicant, Southern Pacific Communications Co., is an outgrowth of the large Southern Pacific railroad communications system that has been in operation since 1956. The road already has more than 6,000 miles of microwave circuits in operation.

Southern Pacific is building a microwave network to install its specialized carrier system, according to John Albertson of the engineering staff. "We will supply services at rates 5% lower than others because of our existing experience," Albertson told CW.

Switched Network

The largest single applicant is the Data Transmission Co. (Datran). It proposes to build a switched national network, similar to the existing phone system, that will bill users on a timed basis. The Datran

Local Loop Connection Problems Can Be Solved

With the possibility of many specialized carriers dotting the landscape, the question of internetwork compatibility has been raised by some users.

A subscriber of a data network that ends abruptly at a state border will want some assurance that another carrier will be available on the other side to pick up his signals and carry them further.

Minimal Problem

With point-to-point microwave systems, MCI, WTI, and Telecommunications and most of the others, this compatibility problem will be minimal. Effectively a three KHz channel on one system will be virtually identical from one microwave system to the next. And most of the specialized carrier applicants claim their systems are ready to interconnect with other systems when the time comes.

For the data user the risk appears small. If for some reason his specialized carrier cannot bring in signals from another carrier, he will probably be able to switch to the telephone system for a portion of his network, where necessary.

Datran users might have more of a problem in this regard because they will be using a different microwave system directly compatible with other carriers.

But Datran spokesman have said that their system will be connected with any long haul transmission systems that offer economy and don't jeopardize the reliability of the Datran operation. Even so, the Datran user will be operating in a dedicated system where he is limited to the sites he can reach.

The technology required to interconnect separate microwave systems is relatively simple. The data signals are transmitted from one to the next by highly directional antennas which aim or beam their signals to the next tower. The transmission equipment and technology for

Special Report: Communications, Part II

The new specialized common carriers may eventually revolutionize communications, but their effect on most users will be gradual.

Despite the many optimistic predictions, users will not be immediately affected by the new services. Data networks take careful planning before they are set in operation. This month's special report gives users an overview of what is available, what can be expected, and the trade-offs associated with the new data services.

Last week's report considered how the specialized carriers evolved, what MCI service means to the firm's first users, and the potential data uses of cable TV systems in urban areas.

system would begin service in 1974 but the FCC has yet to rule on the application.

Datran plans to switch its calls (it will handle only data) through computers installed at regional centers. While the CPU interaction would give potential users the ability to reach several terminals simultaneously, the plan requires extensive special software. According to estimates of the firm of Arthur D. Little, the Datran system could cost up to \$400 million for construction.

The company has already spent an estimated \$10 million in anticipation of network operation. Datran plans to build its initial network to serve 35 major metropolitan areas in about three years. Unlike MCI which is connecting regional systems into its growing network one at a time, Datran plans to throw the big switch on its 35-city network early in 1974.

Datran plans to offer switched service at data rates of 150 bit/sec, 4,800 bit/sec, 9,600 bit/sec, and 14.4 Kbit/sec. Rates will be based on six-second blocks of time called Data Units. The company plans to have both local and national rates, each

of which will be based on the amount of Data Units used by the subscriber.

In addition, Datran will provide its users with a Digital Communications Console (DCC) that will be installed as the interface between the user's site and the Datran network. The DCC will cost \$15,000 and will be a terminal unit to provide necessary signals and coordination between calls.

Since the Datran system will not have a voice capability, it will not be possible to talk to another subscriber under normal operating conditions. Data users on the Bell System who now pick up the handset on a Bell model can set up the conditions for a data transmission that will use the computer logic of the DCC instead.

While Datran rates will be based on usage time and data speed, a "typical minimum monthly fee" will be \$400/mo, according to a Datran spokesman. This figure would include two hours of "national transmission time" and three hours of "local transmission time" plus the \$15 monthly charge for the DCC.

Is there enough room for a duplication of specialized carrier routes, in many

(Continued on Page 9)

this type of system has been used on private microwave systems and in the military for some years and it is considered well within the state-of-the-art.

It is also relatively simple to connect specialized carriers to the backbone of the proposed microwave systems. Transmitting towers must be spaced at long intervals and maintenance is usually minimal.

Problem Area

A larger problem area is the local loop connection from the user's site to the specialized carrier backbone. The FCC is currently studying several proposals in this area that would utilize special frequencies for these short distance transmissions.

FCC to Rule on Satellites

Next week's special report looks at the prospects of early benefits from satellite communications and the methods required to adapt such systems to the needs of the computer user. The eight applicants for satellite spectrum are currently awaiting an FCC decision on satellite policy expected this spring.

The report will also discuss the communications growth areas predicted for the seventies and the Bell System plan to apply special rates to specific users.

Local loop methods are being studied by all the specialized carriers. The reason is obvious. A highly reliable backbone transmission system is severely limited when a majority of subscribers cannot be easily connected to it.

Among some of the possible local methods are short distance microwave transmitters that would send data from the roof of the subscriber's building to

the specialized carrier's terminal.

In addition, Datran has been experimenting with optical systems using infrared and laser beams, with encouraging results. More conventional hook-ups using telephone company wires (already available at most locations) and cable facilities can be used for local loops.

But telephone wires mean that users need to install modems. Future all-digital links will eliminate modems in favor of simpler interface devices.

MCI's initial service to subscribers will utilize telephone company-provided local loops. But telephone facilities make a specialized carrier dependent on lines not entirely under its control. The desirable goal is end-to-end service supplied by specialized carriers.

Agreements

The use of telephone company wires for local loops by specialized carriers on one specialized carrier that also affect the user. To obtain telephone facilities, a specialized carrier must sign an agreement with the local phone company. In many cases such agreements are not subject to approval by regulatory agencies. Since the phone company knows it will be used by competitive carriers, these agreements often include high mileage charges which must be passed on in some form to the data user.

There are distance limitations as well. In Chicago the MCI-Illinois Bell agreement limits local loop service to a 30-mile radius from the city.

But these problems are not insurmountable, and it is expected that the specialized carriers will develop their own local technology as soon as the regulatory and technological problems have been settled.

Editorial**Data Security, Control Must Go Hand in Hand**

The FBI's "national data bank" continues to grow larger — and so does the threat to adequate security.

State officials now are attacking an FBI regulation that a computer linked to the National Criminal History System must be used only for law enforcement purposes [CW, Jan. 12].

It should be noted that this rule was not thought up on the spur of the moment. It was originally proposed by the Project Search people who did the groundwork on the system with funds supplied by the Law Enforcement Assistance Administration, U.S. Department of Justice. The LEAA itself later made the same recommendation.

State officials cite a number of reasons why they believe the rule is impractical. They note that some states require that all state computers be consolidated under a single agency. They note that a computer dedicated to the NCHS might be idle most of the time and therefore unnecessarily expensive. And they note that the easiest way of supplying the backup CPU required by an on-line system like NCHS is to have a consolidated installation.

As to security, they insist that adequate hardware and software security can be built into a shared system.

We disagree.

In the first place, we don't think any national system that can be accessed by a variety of local law enforcement and other justice agencies can be considered secure. So we are completely opposed to any attempt to decentralize control any further.

And we don't see any real need to change the rule.

Large states should be able to dedicate two CPUs to justice work without hardship.

Smaller states and cities can acquire two smaller CPUs and load all their justice work on them, including court and correctional systems. If this doesn't keep the computers busy, the justice agency which operates them could get permission to do service bureau work for other government agencies while still remaining in total control.

FBI Director J. Edgar Hoover summed up the situation this way:

"If law enforcement or other criminal justice agencies are to be responsible for the confidentiality of the information in computerized systems, they must have complete management control of the hardware and the people who use and operate the system. These information systems should be limited to the function of serving the criminal justice community at all levels of government — local, state, and federal."

We emphatically agree. The FBI already has more information on file than we think it needs, and it is making more and more of it available by remote access. Since government agencies love to collect information and DP people love to message and disseminate information, we can assume more and more types of personal information will be added over the years to the FBI's remotely accessible files.

Therefore, every effort should be made to tighten security — not weaken it.

Deliverance or Delusion?**Letters to the Editor****Charges Should Equal Value of Service**

Reference is made to Alan Taylor's "Computer Bills: Should the Charges Vary with Each Job Execution?" [CW, Nov. 3].

The basic point underlying his discussion is that distinction between the computer and the function is clear in the marketplace where the customer and the vendor are at arm's length. What the customer pays for a service is the price of the service, while the cost is what the vendor has to expend to produce the service.

From the user's point of view, the value of the same job executed at different times will be the same and therefore the price should be the same. On the other hand, from the point of view of the organization furnishing the service, the cost of the same job done at different times may be different from time to time.

It is my present opinion that the charges made should not be mere cost allocations, but instead should be charges which are equal to the value of the service rendered.

With this principle in mind, the principle in the determination of the value of service, a much more difficult task for an internal service agency than the determination of the cost of service.

Eric A. Weiss
Consultant

Sun Oil Co.,
Philadelphia, Pa.

Assign Resources To Find Answers

Alan Taylor's Nov. 3 report scrambles the concepts of direct costs with indirect costs and then concludes the resulting project inevitable.

When a production process has two or more types of output, the indirect costs associated with the production process must be arbitrarily assigned to the units of output. There is no alternative.

This argument, when applied

to a multiprogrammed computer operating in the environment Taylor described, can be translated approximately as follows: the operating system and its committed resources are indirect costs; the same resources split other costs and assigned to process the user's work are direct costs. How the two are separated is complex but not much different from other highly integrated production processes.

Taylor is very helpful in presenting the "Overcharging of Investigators," for they can be used to test whether or not an assumed cost technique is "methodologically appropriate" or not. Taylor is also helpful in raising the issue by asking, "Should the Charges Vary With Each Job Execution?" resources clearly need to be assigned to find answers. Alan Taylor should be involved in the subject so he can learn about this subject.

H.H. Hirsch, Director
Administrative DP Center
Purdue University
Lafayette, Ind.

Programs Wanted For Home Building

As a result of the many requests for information on computer programs for the National Association of Home Builders has embarked on a program to review the existing computer programs applicable to the home building/construction industry and disseminate this information to our members.

We would appreciate hearing from companies who already have programs for feasibility analysis; single, multifamily, garden and high-rise construction; mobile home parks; and commercial and industrial developments.

Please address responses to:
Richard P. Todrin
National Assoc. of Home Builders
1626 L Street, N.W.
Washington, D.C. 20036

A Key to Success?

I refer to the Dec. 15 letter from James L. Bradley, vice-

president, Management Data Services, Inc., in which he referred to a CDP's D. I. letter asking what "OEM" means.

Let me just state that knowledge of the meaning of OEM is not much of an essential piece of data processing knowledge as one might think for writing a program, running a computer, or managing a DP shop, any more than visiting a local bar is necessary to becoming a vice-president of a company (or is it?).

Terry E. Berryman, CDP
Davenport College
Grand Rapids, Mich.

Avoiding the Crush

Your blurb at the end of each week's *The Taylor Report* which reads, "The views expressed in this column do not necessarily reflect those of Computerworld," is to be copied by our subscription renewal practice of supplying too-big return invoices and too-small return envelopes.

However, I have used and enjoyed your publication thoroughly (except the first issue, onward) and so I forced the wrinkly invoice and my beat-up check into the envelope, anyway, thus avoiding this crushing experience for one more year.

Mark C. Ryan

Chicago, Ill.

When the tab with the pin feed holes is torn off, the form will fit in the envelope. However, a recent batch of forms was not properly perforated and had to be torn to fit. The original can't be torn off easily. The carbon copy of these forms is properly perforated and may be returned instead of the original Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 787 Washington St., Newton, Mass. 02160.

Well Done, Grass Roots, The Breakthrough Is Yours

During the past few months I have been watching with very considerable interest the activities of the Society of Certified Data Processors, and the grass roots opinions on professional matters that they were publishing on the Professional Viewpoint page in *Computerworld*.

The viewpoints expressed are not just of society members alone, but of the general data processing professional whether or not a society member, before or after CDP holder. Just professional opinions, nothing more, nothing less.

The latest arguments seem to be to do with questions somewhat internal to the profession — such as how to avoid being given unprofessional jobs (finding excuse to sack other professionals), or how to avoid having to do work that is not to the employer's request. These types of discussions are good and important. A professional cannot give of his best unless provided with an adequate professional environment. For the moment I would like to discuss some of the more important implications that have been involved in some of the earlier discussions — discussions dealing with the effects of data processing outside our profession.

These discussions have centered around just what the role of the general professional is — are we not better off if they should be? This is grass roots material and of real leadership quality — leadership that the writers of our various codes of ethics have never been able to provide.

What the Professionals Said

What these working professionals said is so simple that it might well not be noticed. They voted strongly to defend the good name of their profession, by taking action to stop the use of "The Computer Failed" alibi even to protect their employers.

This is important. No industry, business or profession — and certainly not one developing as much as data processing still is — can afford to be known as an all-purpose scapegoat without taking vigorous countermeasures. I am glad about this response. But I am also glad the professionals did not stop there.

Output Responsibility

They also said that the data processing manager did in fact have a duty to notice when his computer output was either inaccurate or illegal.

And that, my friends, is not just important — it is also brand new in our profession! Moreover, in at least my opinion, it is a prerequisite to becoming real professionals, and not just highly paid technicians.

Use Bill of Rights

One of the most important implications of acceptance of a professional duty is that it provides the same rights I use for my personal — such as a credit card holder — whose records are maintained on a computer by some using department or firm) with some rights for the first time.

In a professional environment, the user has the right to expect that the people in the data processing operation will be in accordance with computer output. This is good and important.

This acceptance also gives a user a general reassurance that as he sees society moving fast into a computer age, the professionals will not ignore the needs of

society to have its laws and regulations obeyed. This also is good and just as important.

In fact, it is important that these implications that in celebration of this grass roots leadership are now being prepared go beyond the bounded profession. I thought it would be good to start writing a Computer User's Bill of Rights — based on the data produced by the Society of Certified Data Processors.

There is a difference, naturally between the wording of a professional opinion, and the right that comes out of it, so I will try to explain matters step by step as I go.

The voting said that a DP manager had a duty to know about inaccuracies or illegal computer output. It is only possible to do this and proper for a DP manager to instruct other departmental personnel to watch out for such occasions, so that in fact the duty applies not just to the overworked manager himself, but also to the rest of the organization. I also thought that one has a right to expect all DP professionals to watch for and report

"...the status of the computer professional is now seen to be tied into the rights that we give to the innocent third parties whose records we process without having them represented when we make our decisions."

The wording of these working professionals did not specify where the report should be made, but insofar as computer professionals are in fact professionals, then the report should be made like all other professional reports — to corporate officers or their formally designated representatives.

Bill of Rights

So, now that we have determined the content of the material, we can start developing some wordings to put the content into use.

Here are some of my first drafts:

WHEREAS INACCURACIES in computer output, however caused, may hurt others, they should never be ignored by computer professionals, but shall be immediately reported to the responsible corporate officer.

Then, for the case of illegal computer output, an equivalent set of words could be used, like this:

WHEREAS ILLEGAL computer output, however caused, may hurt society, actual or suspected illegality should never be ignored by computer professionals but shall be reported to the responsible corporate officer.

That is what the grass roots professional has said should occur — and I agree with him. I like the way he has effectively given the right to the people whose records are stored (and sometimes managed). This is long overdue.

But in particular I like the fact that in giving something away the professional has actually gained something for himself! He has now described some of the aspects under which a computer could, and should not be used. If he has a duty to report inaccuracies, etc, then surely his employer has a duty to listen if they are to employ him professionally. So we now have the start also of the Computer Professionals' Bill of Rights!

A professional user has a right to have a formal reporting channel to the responsible corporate officers. Moreover, his use of such a channel should not expose him to criticism. He may, for instance, have occasion to use it preventively, as for instance when inaccuracies are only possible but not yet occurred.

And he must have a right to use it when problems have occurred, even though the problems may be financially embarrassing

Draft for a Computer Bill of Rights

• Whereas Inaccuracies In Computer Output, However Caused, May Hurt Innocent Third Parties Such Inaccuracies Shall Never Be Ignored By Computer Professionals, But Shall Be Individually Reported To The Responsible Company Officer and

• Whereas Illegal Computer Output, However Caused, May Hurt Society, Such Illegality Or Suspected Illegality Shall Never Be Ignored By Computer Professionals, But Shall Be Individually Reported To The Responsible Company Officer.

Moreover, In Order That Such Inaccuracies And Illegality Be More Explicitly Rooted Out It Would Seem That:

• Owners & Operators Of Computers Wishing To Provide Professional Level Use Of Data Processing Must Provide Formal Reporting Channels For All Computer Professional Staff To Responsible Corporate Officers For The Reporting Of Actual Or Suspected Computer Output Inaccuracies Or Illegality, and Shall Require That Such Channels Be Used Whenever Such Faulty Output Is Known Or Suspected, and that

• No Allegation That Computer Errors Caused Any Processing Failures Anywhere In The Organization Shall Be Made Without The Allegation Itself, Its Distribution And The Supporting Evidence Having Been Supplied To The Computer Professionals Involved.

need not repeat it here.

As a next step I'd like to see our industry leadership follow this grass roots leadership. And I'd like to see an alternative which may be more appropriate, that others may feel are more appropriate.

But even without this hoped-for action, one thing is certain: the status of the computer professionals is now seen to be directly tied into the rights that we give to the innocent third parties who receive professional process. And having these representations when we make our decisions. And that was a real surprise, for me, at any rate.

© Copyright 1972 Alan Taylor. Reproduction for commercial purposes requires written permission. All rights reserved. For non-commercial purposes, permission may be made provided they carry this copyright notice. The views expressed in this article do not necessarily reflect those of Computerworld.

LEASING OR BUYING USED COMPUTER EQUIPMENT?

WHY NOT DO BUSINESS WITH THE PRO's?

IPS sold, in the month of December:

2 360/65 complete systems
1 360/50I
1 360/40
2 360/40 Core Units
2 360/30's
1 360/20 system
Miscellaneous peripherals

IPS leased the following equipment in December:

1 360/65 system
1 360/40G system (3 year firm lease)
1 360/20 C1 system (5 year firm lease)
1 2314-1 (42 month firm lease)
3 2401-2 Tape Drives

When you have complete systems or peripherals to sell, buy or lease, deal with the people who can make things happen.

SAVE TIME AND MONEY

Call: Information Processing Systems, Inc.

467 Sylvan Avenue
Englewood Cliffs, New Jersey 07632
(201) 871-4200

PROGRAMMING SYSTEMS ANALYSIS SYSTEMS DESIGN

- Highest Quality Service (Top References)
- Unreasonably Low Rates
- Satisfaction Guaranteed Or You Pay Nothing

Call Bob Lockwood

Systems Service Corp.

249 W. 34th Street
New York City, N.Y. 10001
(212) LO-4-5852

January 19, 1972

Random Notes**Batch-Oriented 'Autotab' Released by Capex Corp.**

PHOENIX — Autotab, a financial planning software package that has been in use on the GE time-sharing network for the past year and a half, is now available for in-house use on IBM 360/370, Honeywell 600/600, and CPUs from the developer, Capex Corp. The package is designed to allow non-programming users to generate forecasting, business modeling, budget systems, sales analysis, capital flow reports, and investments reports. Input from the DP staff, it operates in a batch environment, or under RJE, CRJE or TSO. In 60K bytes on a 360, it is available for \$7,500 on a perpetual license from Capex Inc., 2613 N. Third St., 85004.

Real Property Income Studied
By Alton Peck, WWD B3600
SACRAMENTO, Calif. — Bank real estate developers or brokers, with access to e Burroughs B3600, are able to simulate investments in income-producing real property in great detail, with the Real Estate Investment Analysis Modeling software from Alton Associates Corp., 505 W. Olive Ave., 90008.

Within the model, the results of statistical analyses of a large number of real property types can be used to produce sophisticated investment guidelines. The \$10,000 model is capable of estimating parameters when factual data is unavailable.

Piping Compared to Local Codes
By Service From Texas Company

HOUSTON — Service From Texas Company will be comparing piping systems can send their engineering drawings to Engineering Technology Analysts Inc., 3310 Richmond Ave., 77006, for stress analysis and checking against applicable piping codes.

The service accepts power, petro-lem, gas, and nuclear piping systems.

NCR Police Software Extended
LYPTON, N.Y. — NCR has released additional modules of the Law Enforcement software designed for use on Century Series CPUS. A Control and Translate module builds files and handles input validation for the other segments of the system. A Cash Inventory unit is described as the operational module of the system, keeping users posted on current actions.

A Police Information module maintains a master file of wanted persons and stolen property, generating reports appropriate to those areas. The Case Inventory and Police Information modules, each for \$8,100 each. The others are available without cost.

BA Broadcasts Payroll Service
SAN FRANCISCO — Subscribers to the Bank of America payroll service, particularly manufacturers, who sell their payroll services, can have more comprehensive management information reporting through new features in the service.

The payroll service has been extended to provide for the withholding of state taxes, as well as federal. A mobile payroll service is also to combine information from the payroll and payable service into one managerial report resulting in better control and a clearer distribution of material and labor costs.

TBI, Scopus Services**Quality of New, Old Tapes Checked**

By Don Leavitt

Of the CW Staff

Magnetic tape installations should be able to operate with higher levels of confidence in the physical condition of their files, through the use of either or both of two new services. Those users who buy their own tapes can have them tested by Time Brokers Inc. (TBI) under its Tape Quality Control Service.

Existing libraries can be checked up to fixed standards, then maintained at those levels, through a tape purchase-lease back plan offered by Scopus Corp., Lowell, Mass.

Under TBI's new service, users receiving new tapes can have them checked forward a percentage of the order to TBI, without opening the original shipping cartons. TBI tests each reel on its electronic equipment and provides a commented test graph when the tapes are returned to the user.

TBI says that it can check any half-inch magnetic tape, either 7- or 9-channel, and charges \$3.50/reel, with no minimum price per test session. The firm is 100 Executive Blvd., Elmsford, N.Y. 10523.

IBM FDPs Aid Hospitals, Clinics

WHITE PLAINS, N.Y. — Half a dozen new Field Developed Programs (FDPs) from IBM can help hospitals and clinics solve a variety of accounting problems. Four of the programs are used on System 3 hardware; the others, on larger equipment.

Two of the System 3 programs focus on patient accounting while the others support accounts payable and inventory control functions. Users of IBM's Shared Hospital System, which runs on 360/370 CPUs, can pick up support for Medicare accounting with another of the FDPs, and users of IBM 1800 systems are provided specialized hospital data acquisition capabilities with the last of the new programs.

One of the simpler programs for a card-oriented S/3, Medicare Billing, handles the routine processing and billing for patients and provides management reports and printing of government-specified forms to fulfill Medicaid requirements.

The Clinical Accounting package, geared to a disk-based S/3, can also generate Medicare forms, but outputs conventional patient accounting statements as well. Income statements and revenue and expense summaries are also available with this FDP.

Data needed to control payments to vendors, including both the writing and receiving of checks, are available with the General Stores Accounts Payable package, while inventory management, including generation of purchase orders, is provided by the General Stores Inventory package. Both of these FDPs are for card-oriented S/3.

The Shas Pending Insurance Claims Accounting, on a 360/370, maintains a file of claims forwarded under the Medicare Part A program.

Each of the FDPs is available under license agreement with monthly charges for the first 12 months of use, after which charges are waived. The charges range from \$100/mo for General Stores Inventory system to \$1,185 for Hospital Data Collection and Communication.

Scopus purchase-lease back plan is intended to help users overcome contamination and physical damage caused by poor handling and mishandling of the tapes. During the first year of the plan, all of the user's tapes will be evaluated on Scopus equipment, the company

says. Tapes that are found to have an unacceptable number of errors, a criteria established by the user and not Scopus,

can be retired and replaced.

The user has the option of specifying the manufacturer of the replacement tapes, the company adds.

Once the library has been brought up to the user's chosen quality level, Scopus performs periodic cleaning, component inspection and replacement and continuing evaluation of the tapes in service.

Scopus can be contacted through P.O. Box 1241, Lowell, Mass. 01852.

Program Backs Systems Planners

PITTSBURGH — Systems and programmatic analysis can reduce the time needed to create and maintain system specifications, and programs can cut sharply into the time needed to code Cobol programs, with the Programmer-I utility software from Comshare.

The program generates record layouts, file I/O flowcharts and selective identification. Environment and Data Division Cobol source statements, or any combination of these options, all in a single page of the system.

While the package is designed to show the grouping of individual files and their relationship to programs within a system, it does not consider internal program logic. It creates neither Procedure Division coding nor detailed program logic flowcharts.

The Cobol source statements generated by Programmer-I can be directed to

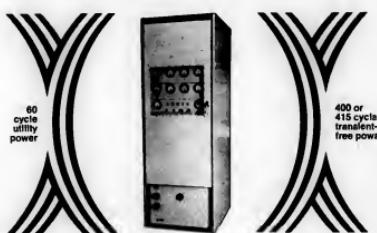
punched cards, tape or disk, and ultimately catalogued on a user library, to be combined with conventionally coded Cobol program logic as input to a compiler.

The file I/O flowchart symbols are similar to or compatible to those recommended by ANSI. Supplementing the standardized shapes, however, Programmer-I also prints the specific type of device on which the designer expects the file to run.

The software operates under either DOS or OS/360 in 48K of memory, with a disk or tape.

Programmer-I is available in object form for \$565, including documentation, a supply of specification sheets and six months of support.

Comshare Services is at 530 Sixth Ave., 15219.

400 CYCLE COMPUTER POWER ALL SOLID STATE

Every year more CPU's require 400 cycle power. Now IBM's 370/165 and 370/195 utilize 415 Hz power joining various CDC, GE and Univac models. Typically, motor-generator conversion units have been employed to provide this power. However, the cost of these units is high, as well as their performance, lower operating costs and reliability ten times as great as rotating devices. Available in redundant and non-redundant configurations, Avtel's solid state power units also provide transient-free power. These units are convertible to Uninterruptible Power Systems (UPS) if desired. All models are fully compatible with computer power requirements. For further information, prices and leasing terms contact:

AVTEL
CORPORATION
an Artronics Subsidiary

1130 EAST CYPRESS STREET • COVINA, CALIFORNIA 91724 • PHONE (213) 331-0661





Any media storage cabinet you buy now may be obsolete before it is delivered...

before you buy, find out about the improved storage efficiency and cost advantages of new optimedia™ cabinets

Two years ago we decided that it didn't make much sense to keep designing cabinets that were locked-in to the storage of cards only or tape only or one type of disk pack. So we studied the total media storage problem from all angles and came up with what we believe is the ideal solution: optimedia™ coordinated cabinets can store all types and sizes of data processing media. They can store them in virtually any combination you desire, and — when your storage requirements change, optimedia cabinets can adapt to the changes. They're sort of a "living" storage system that won't become obsolete or leave you with excess capacity for one medium and not enough for another.

optimedia™ coordinated cabinets have other benefits such as "Action Level" storage that lets you place all media at the most convenient retrieval height, smooth operating roll up doors that open all the way leaving the entire inside fully accessible, and up to 20% extra storage capacity when compared to other cabinets with the same outside dimensions.

So . . . hold up that purchase requisition until you can hear the full story on optimedia™ coordinated cabinets. That way you may avoid buying something that's obsolete before it's delivered.

For the complete story on optimedia™ coordinated cabinets, call your local Wright Line office. You'll find it listed in the yellow pages in all major cities or contact us by writing direct or circling the readers' service number. Wright Line, a Division of Barry Wright Corporation, 180 Gold Star Boulevard, Worcester, Massachusetts 01606.



MEDIA MANAGEMENT SYSTEMS

The Forum and Exhibition Schedule

Each Day

9:00-9:40 Keynote Address

Day One — Lawrence Feldman
Mr. Feldman will speak on Data Communications from 9:00 to 9:40. His subject is data entry, and he experience makes him an expert in this field. Currently he is President of Management Information Corporation of Cherry Hill, New Jersey and editor of *Data Entry Today*. He's an instructor at Drexel University, and recently collaborated with the Berman on a 10-year study and projection on the DP industry.

Day Two — Dr. D. Leon
Dr. Doli will speak on Data Communications. He is an acknowledged expert in this field, and does consulting work in addition to his activities as a faculty member of the Eastern Michigan University graduate school of business. He is a past president of the American Chapter of the ACM.

Day Three — Charles Leach
Mr. Leach's subject is Operational Efficiency. He is an internationally known speaker, consultant and author. His programming books are recommended reading for the COP exam of the DPMA, and he has prepared several papers for the Association of Management Associations. Mr. Leach is a President of Advanced Computer Techniques of New York.

Each of these speakers will also observe the panel discussions and deliver a summary during the conference luncheon.

9:40-10:30 Panel Discussion

Panelists are regional experts in the particular field. They have first-hand experience with the latest equipment and services, and they are known in their areas for their progressive management principles. They are not representatives of computer manufacturers.

Principles and operations are the target for discussion, not equipment suppliers. General questions are encouraged.

10:40-11:45 Workshops

Each panelist leads a workshop — and this is where your specific questions are discussed and worked out. Where the discussion goes depends on your needs. What do you, the user, want to learn or discuss?

12:15-1:30 Conference Luncheon

The keynote speaker summarizes the important points of the day's panels and workshops over a pleasant lunch.

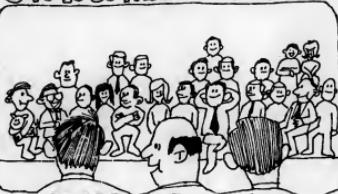
1:00 PM-9 PM Exhibits Open

You've listened and talked all morning. Now you can see the latest equipment and services in action. 60 exhibitors present their latest, in a pleasant, uncrowded exhibit hall.

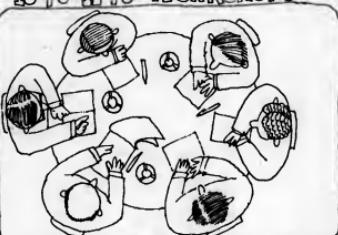
9:00-9:40 KEYNOTE ADDRESS



9:40-10:30 PANEL DISCUSSION



10:40-11:45 WORKSHOPS



12:15-1:30 CONFERENCE LUNCHEON



TOPICS

On each day of our three-day show we are devoting our forums to a particular topic of wide current interest to computer users.

First Day

DATA ENTRY

The keynote session on data entry is followed by panels and workshops on

- Keypunch Replacement: key to tape, disk and cassette devices
- OCR
- Intelligent Terminals (distributed processing)
- Direct Data Entry/Source Data Automation

Second Day

DATA COMMUNICATIONS: THE CHOICES

The keynote address deals with the overall picture, and is followed by panels on these subjects:

- Communications equipment from mainframe makers and common carriers
- Communications equipment from independent suppliers
- Data Transmission via private (lines, microwave) networks
- Data Transmission via carriers (lines, microwave)

Third Day

OPERATIONAL EFFICIENCY

Panels and workshops deal with the following topics:

- Core Extensions
- System Utility Software Modification
- Independent Peripheral Usage
- Dedicated Systems vs. General Purpose Computers

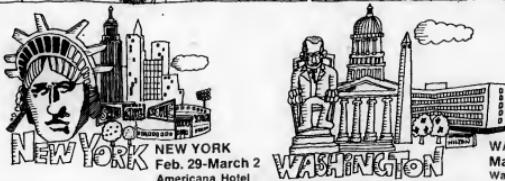
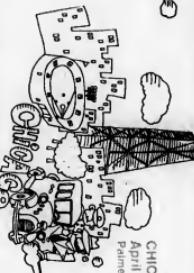
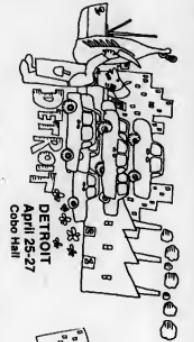
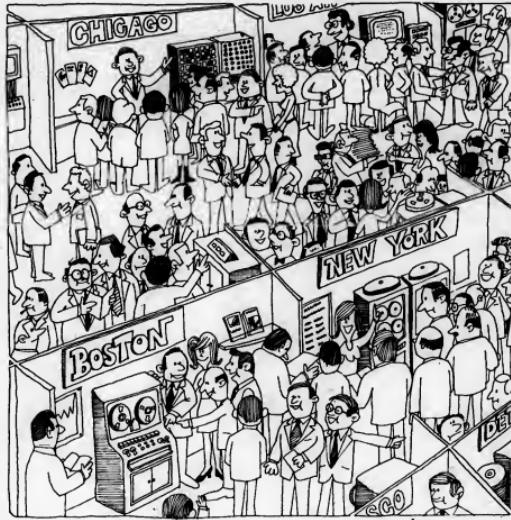
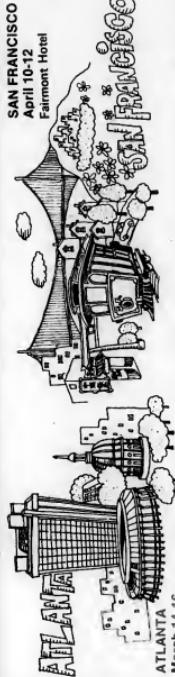
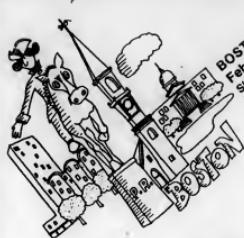
EXHIBITORS

The following is a partial list of exhibitors:

- Lockheed Electronics Company
- California Computer Products, Inc.
- Amdahl Corporation
- Sanders Data Systems, Inc.
- Inosim Corporation
- Inforax, Inc.
- Centronics Data Computer Corporation
- Iomec, Inc.
- Hewlett-Packard Company (Computer)
- International Business Machines Corporation
- Tachtron Industries, Inc.
- Boeing Computer Services, Inc.
- Grahams Management, Inc.
- Digital Computer Corporation
- Eastern Kodak
- Verian Data Machines
- Tally Corporation
- Instacorp, Inc.
- Sycom, Inc.
- Natus Corporation
- Systemax Corporation
- Applied Data Research
- Texas Instruments Incorporated (Digital Systems Division — Houston)
- Veristar, Inc.
- Tel Corporation
- Input Output Computer Services, Inc.

THE COMPUTER CARAVAN IS BRINGING 60 to put 85% of the computer users in of new products, new services

The Computer Caravan is sponsored by Computerworld. And it's designed to give you a chance to spend one, two or three days at a nearby, uncrowded, professionally oriented seminar and exhibition. You'll be discussing the topics that interest you with experts in the field. Experts who are user-oriented. Who know your problems and have first-hand experience with the state of the art. Then you'll have a chance to see the latest equipment and services in action, as 60 companies show you what they have to offer.



EXHIBITORS TO 9 CITIES FOR 1 REASON

the United States within 2 hours and expert advice.

Some of the details are above. The rest will follow in Computerworld. And we'll see you there when the Computer Caravan opens in a city near you.

If you'd like exhibitor information, just call or write Charlie Asmus at Computerworld, 797 Washington Street, Newton, Mass. 02160. (617) 332-5606.

THE COMPUTER CARAVAN

It's Coming.

THE COMPUTER CARAVAN

A New York Area Computer Users' Forum and

Exposition Is Coming To



NEW YORK
Feb. 29-March 2
Americana Hotel

Sponsored by Computerworld
(617) 332-5606



The Novar 7-70 Data Collector System receives data from Novar terminals via phone lines and records it in IBM computer compatible format—9 track, 800 bpi—on 8½" reels. It will also transmit data to Novar terminals.

Complete with minicomputer and software.

NOVAR

1000 California • 2570 Charleston Road
Mountain View, Calif. 94030 • (415) 964-3900
Offices in Principal Cities

GTE INFORMATION SYSTEMS

CHI CORE offers 1130 and 1800 users up to 65K of add-on high speed core storage for 50% less than IBM.

Write for a CHI CORE brochure with specifications and information.

Computer Hardware Inc.
2550 Fair Oaks Boulevard
Sacramento, California 95825
Phone: 916-461-7723



Inventory Management - Part III

Orders Can Anticipate 'Lumpy' Demand

By Richard T. Lilly

Senior Computer Analyst

As noted last week, there must be sufficient documentation so that upper management can establish inventory policies, examine the effect of those policies and consider alternatives. But any system will fail when used (on all levels) as a user of the system is inconsistent.

To this end, documentation must be good enough to allow operating management to understand the principles and theories involved in the system.

In prior installments, Lilly showed how inaccurate balance-on-hand amounts can be controlled, and outlined a comprehensive warehouse control report for management's use.

Here he cites the hazards of ineffective documentation in general, and details how "lumpy" demand can be anticipated.

System and operating personnel to understand the reports, exceptions and actions to be taken on a day-to-day basis.

The system's documentors must be careful not to become too technical in system's explanation for the user. Technical explanations where required should be in an appendix.

Other documentation should be:

- Definition of terms used in the documentation.
- Definition of reports, their function and action to be performed.
- Layout of all input.
- System flows.
- Action to be taken based on exception output.
- Data control procedures.

Each person at all levels of control should have sufficient information to enable him to manage his portion of the system, however small. Lack of this information is a system malfunction.

Most sophisticated inventory control systems use some type of modeling techniques to forecast demand for future periods. One of the main benefits to be gained by computerization of inventory is the measurement of the error in the forecast (the Mean Absolute Deviation) and its use to establish safety stock to meet a required level of customer service.

Most systems are skewed, however, is the fact that a number of items do not have a demand which is predictable, due to their "lumpy" character. A lumpy item is one which, for example, has a low volume except for two successive periods.

If the Mean Absolute Deviation of the item based on a horizontal (constant) model is greater than 60% of the average, it can be assumed to be

When a lumpy item is treated as a constant item, an excessive amount of inventory is often generated since the safety stock is too large. Yet even with this value of inventory, the two large demands may not be satisfied. Therefore, we should establish two reorder policies to be used with lumpy items, based on peaks and valleys of demand.

The user must decide whether he can justify carrying a higher level of inventory to accommodate the high demand (peak) that occurs infrequently. If this is justifiable, the reorder point is based on the large peak demands for an item.

If not justifiable, the reorder point will be based on the low volume demands (valley). Unless an item is specifically designated as a peak reorder point item, a valley reorder point will be computed.

For valleys compute the average of all demands less than the original average, then compute the reorder point equal to the valley average X Leadtime + 2.

For peak reorder point, compute the average of all demands through a lead time for all lead times demands greater than the original average through the lead time. Then compute the reorder point equal to this peak average times a safety factor. This safety factor should be greater than 1, and less than 2. An initial value of 1.3 is suggested.

These are the Seven Deadly Sins of Computerized Inventory Control. We have encountered few systems which did not contain a number of these problems. If we list them again . . .

- Lack of adjustment for . . .
- Inability to trace rejected transactions.
- Inability to trace updated transactions.
- No control of floating requirements.
- Lack of continuing management control.
- Insufficient user documentation.
- Ignoring the presence of lumpy demand.

.... we see that all are expressed as "lack of," "inability to," etc.

Thus, the system designer must ensure that, upon implementation, full audit trail control is available at all levels of management.

One final suggestion must be added to overlay the Seven Deadly Sins. Please, please, please do not ignore the need for initial and continuing participation on the part of operating management, beginning with the system design, through implementation and continuing with constant maintenance and supervision of the inventory management system.

Richard T. Lilly is president of Manufacturing Management Sciences Inc., Burlington, Mass.

Bits and Pieces**BTC Allows Mohawk 2400 To Use Complot Plotters**

BELLAIR, Texas — The BTC-7/2400 Batch Terminal Controller from the Houston Instrument Division of Bausch & Lomb, Inc., enables users of Mohawk 2400 series terminals to attach Complot Incremental Plotter.

The interface can be installed in less than one hour and allows automatic plotting up to speeds of 300 steps/sec using the Complot DP-1 or DP-3 plotter. Software to generate plot codes for transmission to MDS 2400 systems is included.

The BTC-7/2400, with plotter stand, is priced at \$2,445. Delivery is 30 days from 4950 Terminal Ave., 77401.

Datum Printer Increases Speed Of PDP-8 Output by Factor of 10

ANAHEIM, Calif. — The Datum 5096 Line Printer System is designed to provide PDP-8 users with a 10-fold increase in printer output at a price of under \$3,000.

The printer system operates at 100 char/sec and consists of a serial impact printer, controller, software and cables.

The unit features the production of six copies, and prints the 64-characters upper case ASCII subset, with other formats available. The unit is currently available from 170 E. Temple Ave., 92801.

TST 717 Replaces IBM 2741

ROCKVILLE, Md. — The TST 717, a serial line data communication terminal designed to replace the IBM 2741, is priced 10% to 15% below the IBM unit.

The terminal, from TST Communications, Inc., operates at 110 and 300 bps and includes standard equipment seven features that are options on the 2741. These include: dial up, interrupt and Typematic keys. The rental price of the IBM unit so equipped is \$105.50/mo.

The TST 717 is available on a 30-day delivery schedule from 2351 Shady Grove Road, 20850.

Winder Has Automatic Clutch

KANSAS CITY, Mo. — The I-Winder punched paper tape winder from Inland Office Products features an automatic clutch that regulates tension and controls the speed of the winding.

The unit has a 1000 ft. capacity and operates at 110V. The price is \$85 and shipment is from stock from 1720 Cherry St., 64106.

Low-Cost 32-bit CPU**Systems 85 Real-Time System Bows**

FORT LAUDERDALE, Fla. — The Systems 85 real-time processor from Systems Engineering Laboratories, Inc., a new processor version of the company's Model 85, is described as the lowest price 32-bit computer system available.

Competitive in performance with such machines as the XDS Sigma 5 and the DEC System Ten, the Systems 85 offers prices that are from 20% to 40% lower, SEL says.

Compared to the SEL Model 86 which has a 600 nsec cycle time, the Model 85 has a cycle time of 850 nsec and prices that are 10% to 20% lower.

The Systems 85 is available with core memory expandable from 8K to 128K words, and includes a 16-bit byte and word protection standard. The 85 requires one instruction to address any bit, byte, half-word, word or double word in memory.

Total data handling capacity of the Systems 85 is 1.17 million words/sec. Up to 16 simultaneous data controller channels, each of which can handle one or more peripherals, can be attached to the computer's I/O bus.

The Systems 85 is hardware and software compatible with the 86. Software available includes operating systems for real-time, microprogrammed and batch processing. Real-time Monitor (RTM) provides a software priority structure for concurrent execution of up to 255 tasks, and permits job-stack processing in a background mode.

Both the Batch Processing System (BPS) and RTM support a variety of language

processors including extended Fortran IV, macro assembler, media conversion programs, utilities, debug routines, and diagnostic programs.

Prices for the Systems 85 range from \$120,000 for a 32K system with a teletypewriter to more than \$400,000. Lease prices start at \$1,200/mo with one-, three-, and five-year arrangements available. First deliveries will be made in July 1972.

A complete line of peripherals is available for use with the Systems 85. These include ISS and CDC disk drives, both fixed and moving head types and CDC

magnetic tape drives.

A similar configuration of the DEC System Ten or the XDS Sigma 5 reveals the following. The prices of the Systems are roughly comparable, with the XDS and DEC systems both somewhat higher, at about \$199,000 and \$213,000, respectively, while the SEL system is priced at \$180,000.

Cycle time of both the SEL and XDS is 850 nsec and the DEC is 1.0 nsec. The number of instructions performed/dollar is 2.5 on the Systems 85, 1.8 on the Sigma 5 and 1.9 on the DEC System Ten.

Royco 205A Monitoring System Prevents Damage to Disk Drum

MENLO PARK, Calif. — An automatic maintenance monitoring system for rotating memory drives from Royco Instruments, Inc., is designed to protect the user against head crashes.

The Model 205A is intended to ease maintenance procedures for disk packs and drives by automatically detecting particle build-ups that can cause data errors, diskettes or head crashes, the company said.

Up to 10 memory units, either disks or drums, can be monitored by a single Royco device.

Unit deterioration caused by dirt, pack



Royco 205A Components

warpage, oil bearing leaks, or other mechanical trouble in the drive can be detected.

Excessive particle counts trigger an alarm lamp, sound an audible signal and, if necessary, retract the read/write heads to prevent disk or drum damage.

The Model 205A automatic maintenance monitor system, complete with underfloor mounted valve manifold and sensor plus a maintenance level indicator module and autosequencer control panel, sells for \$3,400 and leases for \$105/mo. Delivery is 30 days from 141 Jefferson Drive, 94025.

Tape Cleaned in 5 Minutes

TARZANA, Calif. — The Mark IV magnetic tape cleaner from Data Devices, Inc., uses no cleaning fluid.

The device removes oxide clumps, dirt and foreign particles from tape using a cylindrical blade to clean the oxide while a screen cleaner is used for the backing. At the rate of 180 in./sec, a two-pass cleaning takes five minutes.

Priced at \$3,300, the Mark IV is available on a no-wait delivery from 18360 Topham St., 91356.

Programmed Terminal Uses ROM

CAMBRIDGE, Mass. — The Series 200 line of programmable alphanumeric CRT terminals from Computek, Inc. combine the features of both programmable and hardened systems.

The program for the terminal is stored in nondestructible ROM. New programs are easily constructed, according to the company. Replacements are made by exchanging plain program boards. The family of programmable terminals, without the sacrifice of reliability and convenience, the company said.

The Compute 200 can be programmed to generally, verify, edit and manipulate large data files, either as a single file or as a program-unit, and can use a wide range of I/O peripherals, including hard copy devices, mag tape cassettes, disks, badge readers and printers can be controlled by the terminals. Local processing, such as subtotaling and tax computation, can be performed.

The unit has a 1000 ft. capacity and operates at 110V. The price is \$85 and shipment is from stock from 1720 Cherry St., 64106.

handling of 110 to 9,600 bit/sec data rates. Parallel interfaces, allowing data transfer at rates of up to 350,000 bit/sec to disk drives are also available.

As many as 4K 16-bit words of microprogramming can be stored in the MOS ROM. A display refresh buffer, consisting of 2K 10-bit words is provided.

The display consists of a 14 in. screen displaying 80 char/sec at 1024 lines/in. The 16-character ASCII set includes upper and lower case formed by a 9 by 13 dot matrix. Refresh rate is 60 frame/sec.

The 68-key keyboard includes a row of 10 function keys or special function keys and includes controls for full cursor movement, local editing functions and system operations.

Local editing, logic functions and control can be programmed.

The price of a single stand-alone terminal is \$4,570. Delivery is 90 days from 143 Albany St., 02139.



SEND FOR THE FACTS.



CENTRONICS

Centronics Data Computer Corp.
One Wall St.
Hudson, N.H. 03051
603-883-0111

THE COMPUTER CARAVAN

THE NORTHWESTERN COMPUTER USERS' FORUM AND EXPOSITION IS COMING TO SAN FRANCISCO



April 10-12
Fairmont Hotel

Sponsored by Computerworld (617) 332-5606

Two ways to save money on practically any time-sharing service.



With about 150 in the U.S. there is no shortage of time-sharing services. What there is a shortage of, is low-cost terminals and service for them.

So about a year ago we decided to offer terminals that would be compatible with virtually every time-sharing service. And we offered terminals at the lowest prices ever. Add to that nationwide support and it's not surprising that we have leased literally thousands of terminals.

We offer models for every purpose. The Model 33 ASR with acoustic coupler works with any standard telephone. And we can

provide Model 33 or Model 35 for use with Data-Phone* or data access arrangements.

Remember, the type of terminal configuration you select, you can depend on Western Union Data Services Company for nationwide servicing, applications engineering, training and support.

Interested in the most economical and efficient data terminal for your needs?

Contact me at Western Union Data Services Company, 16 Micke Drive, Mahwah, New Jersey 07430. Phone: 201-525-1170. Outside N.J. call toll-free 800-631-7050. Telex: 12-5077.

*Registered trademark of AT&T.



Univac Offers DP Disk

BLUE BELL, Pa. — Univac 400 and 1100 users will be able to replace their Faststrand II magnetic drums with a disk system that has been added to the Univac 8400 disk series.

Acquired from Data Products, Inc., which offered the device as the 1108-compatible 7114, the 44 million word unit features a minimum access time of 10 msec, three times faster than the Faststrand II. Average latency time is 17 msec compared to 38 msec for the Univac unit.

In most respects the disk is compatible with the drum. Both have 64 sector/track with 28 36-bit word/sector. The transfer rate of the disk is significantly higher than the drum at 262KC compared to 158KC.

Rotational speed of the disk is 1,800 rpm compared to 880 rpm for the Faststrand II. The number of read/write heads on the former 7114 at 40 is about 2/3 that of the Univac unit, but announced the disk drive prices, but they are expected to differ not too greatly from the price set by Data Products at 35% less than the \$3,750/mo charged by Univac for its Faststrand II.



High Speed Card Terminal

Futronics Terminal Processes 112 CPM

FREEDOM, N.Y. — The High-Speed Card Terminal from Futronics, Inc. is the first unit available to batch, interpret and read card records as high as 112 card/min., according to the company. Intended for on-line data processing either as a stand-alone unit or as part of a system, the terminal features read-after-punch capability, and can re-punch a new card or read a old one.

The terminal can also be used as a keypunch, with an optional keyboard. The unit is priced at \$18,000. Delivery is 90 days from 178 Hanover Ave., A-11520.

Corpak Reduces Cost Of PDP-8 Memory

LOS ANGELES — The Corpak-8 from Information Control Corp. will allow DEC PDP-8 users to save up to 38% on the cost of adding memory. ICC said.

The unit with a PDP-8/1 with 8K of memory who wishes to expand it would have to pay \$10,600 for each 8K from the ICC. The same memory price at the ICC adds up to \$8,400 for the PDP-8 and \$3,132 for each 4K after that, up to the computer's limit of 28K of add-on.

Corpak-8 memories are available from 9610 Bellanca Ave., 90045.

Software Enhancements Added to Data Editor

MINNEAPOLIS, Minn. — Data Action has added several no-cost software enhancements to its 1500 Data Editor System.

The Data Editor is a mini-based system used to edit and validate data prepared on a key-to-tape system for computer input.

The enhancements include a report writer, enhanced data editing and validating capabilities, generalized tape-to-print and a data file update utility.

A typical 1500 Data Editor System including a magnetic tape drive, 300 line/mi tape, a monitor and CPU costs \$11,000. The software enhancements are immediately available from 4445 W. 77th St., 55435.

Potter VIP Plan Encourages User Diversification

MELVILLE, N.Y. — The Potter Instrument Co. announced a multi-product, tiered payment incentive plan designed to encourage users to use more than one Potter product line and to pay monthly rentals promptly.

Called the Volume Incentive Plan (VIP), it provides a sliding scale of discounts based on the number of products purchased, the length of time products are leased and the promptness of payment. The plan includes tape drives, disk drives, printers, controllers, memories and data communications equipment.

Potter Instrument Co. is at 532 Broad Hollow Road, 11746.

Correction

In CW, Dec. 29-Jan. 5, the monthly rental of the Nanodata QM-1 should have been \$7,000/mo.

DEC COMPUTERS BUY, SELL, RENT, TRADE NEW OR USED

We also have Computer Terminals

DELOS COMPUTER EXCHANGE
100 State Street Dept. 1A Boston, Mass. 02109
(617) 227-4654

UPGRADE NOW!

THE NEW 4100
DATA TERMINAL
instantly updates
your system with
PLUG-IN ABILITY
at LOW COST!



We know that the 4100 Data Terminal will outperform and update existing paper tape equipment to magnetic tape without modification costs. The portability and built-in dual interfaces adapt the 4100 Terminal to any system, including on-line and off-line application and sequential or batch processing. That is why it is now available at a price that is surprisingly inexpensive. In fact, we know that the 4100 Data Terminal is far more sophisticated, more advanced, more applications-oriented, and will give you a far greater return on your investment than other data terminal on the market today. We know because we engineered it that way. If you'd like to know more, call or write for a demonstration soon!

**TECHTRAN
INDUSTRIES**

550 JEFFERSON ROAD, ROCHESTER, NEW YORK 14623 PHONE 716-271-7953

The Bookie



There are 1,150 legal bookies in the big city. Sleek Wyle CRT display terminals which are part of New York's off-track betting system.

Why was Wyle awarded this \$2.5 million contract by Computer Sciences Corporation?

Experience, know-how & fiscal responsibility! Wyle also has a direct replacement for the IBM 2260/2848 CRT clusters with more features for less money.

For expertise in CRT displays & terminals, look to Wyle Computer Products.

WYLE COMPUTER PRODUCTS, INC.

A Subsidiary of Wyle Laboratories
128 Maryland St., El Segundo, Ca. 90245 (213) 678-4251

MIT Gets Grant For DP Library

CAMBRIDGE, Mass. — The Council on Library Resources has granted \$100,000 to MIT to support for one year an experimental, computer-operated technical library that could be a prototype for information retrieval systems in libraries.

The new Transfer Informatex (Informatex) is an IBM 7094 programmed in accordance with MIT's time-sharing system which allows it to be used simultaneously by several users from remote access terminals.

The Informatex data base, stored in the computer on magnetic disk, contains a growing technical library of detailed data on information and materials tests of more than 15,000 recent articles in the field of materials science and engineering.

The Informatex user conducts literature searches by typing out questions and commands on a typewriter connected to the computer access terminal. The computer instructs the novice how to use the system as he proceeds, and anyone who can type the word "begin" (the code word for the instruction "begin reading") can start work almost at once.

"Runt" is Small-Core 'Run' System. The University of Washington has developed a small-core version of RUN, the Fortran compiler for the Control Data 6000 series computers. The miniaturized processor, which has been distributed to 15 other installations, is named, appropriately enough, Runt.

10 KEY NUMERIC PAD

- Designed for use with any terminal ... , Asci, EBCDIC, Beadot
- Adding machine keyboard arrangement
- 10 keys for numeric input
- Eight additional option keys — no add'l charge
- Single key CR-LF-XO-NO
- Can be used on or off line
- Portable—connects/disconnects in seconds
- Unit price \$295.00 Availability 30 days
- Reps Wanted J.F. Gibbons

EASTERN DYNAMICS CORP. 816-231-8800
1158 Suffolk Ave., Brentwood, N.Y. 11717



FROM DRESSER

Special File Folders
for Magnetic Cards
Used in IBM's MC/ST™



F.O. Box 2035, Providence, Rhode Island 02905, Tel: (401) 781-4430

SOFTWARE CONSULTING FIRMS

The use of proprietary software packages can yield significant savings in the time and cost of implementing a new computer application. You can perform a valuable service for your clients by assisting them in locating and evaluating proprietary software whenever a new application is being considered. By offering this service, you are in an ideal position to assist in the definition of software requirements, and in the modification and installation of packages obtained by the client as a result of your recommendations.

We are seeking affiliations with firms interested in broadening their range of activities to include services related to proprietary software packages. We will provide national advertising, a reference library of information concerning software packages currently on the market, and other services in support of firms qualifying for affiliation with SYSX. For further information, contact:

SYSX

Hans Schroeder, President
Systems Exchange Company
1100 El Camino Real
Mountain View, CA 94040
Telephone: (415) 328-5490

Position Announcements

PROGRAMMER
\$14,000

New England. Telecommunications. Leading Mfg. large sophisticated system. Desirable suburban area, sailing & skiing nearby. executive search

Albany, N.Y. 12211 Box 11034

RESUME FACTS

Design your own Professional DATA PROCESSING RESUME by knowing the essential format and information to include. Send \$2.00 for a complete self-analysis and RESUME KIT to:

North-American Computer Associates
2200 South State St. Suite 1616
Chicago, IL 60604
(312) 539-5225

OPPORTUNITY IN 1972

MKTG., MGR.—Peripherals via telephone, 1000-1500, 9410 N. 5th St., ANAHEIM, Calif. 92601. SYS. ENGR.—Data Communications, 1000-1500, 9410 N. 5th St., SLS. REP.—IBM Core Anal. On-Chip, CHI, NYC, ATT, DC, Dallas, Denver, Houston, LA, SLS. REP.—Data Communications, 1000-1500, 9410 N. 5th St., Cleve., LA, FLA, Phila., San Diego, Dallas, Albany, others. \$20,000.

APPLIC. ENGR.—Data Communications, 1000-1500, DC, Boston, others. \$15,000.

DATA ANALYST—Data Communication Systems, NY, San Fran, Dallas, Cleve., LA, DC, Boston, others. \$15,000.

DATA SVCS./C.E.—Major clients. \$60/20/65 peripherals. Major cities.

Call or write now!

B.A.I.
Business Associates, Inc.
36 North Broadway
White Plains, NY 10603
(516) 822-7940

Buy
Sell
Swap

\$\$\$\$\$\$\$\$\$

* Immediate Availability

131 Mod 4
131 Mod 2Want To Buy
3-2547-B1 or 82C A C
Dear A P.O. Box 29185
Atlanta, Ga. 30339 404-464-4474

CFI

FOR SALE AS PRINCIPAL

- 1.0 Srt - \$7900
2040-1 \$205,000
2004-1

4-2311 - \$7,500
2030E (2) M/C CPU

COMPUTER FINANCIAL, INC.

Please contact Gary Grenbrey or Bob Miller
1432 Allee St.,
Anaheim, Calif. 92805
(714) 776-8571

TEACHING POSITIONS

Opportunities exist in a growing Computer Science Department for instructors, M.S. recommended and assistant professors (Ph.D. required) to teach programming, operating systems, and information structures. Beginning Fall semester, September 1972. Send resume to J.L. Dillon: Chairman: Computer Science, Sacramento State College, CA 95819, or if qualified, call (916) 454-6545.

JOBS JOBS JOBS

WHY IGNORE the world's largest employer of EDP personnel? Over 30,000 positions. EDP/CPU's, 8000, 10000, 12000. Positions for all geographic areas. Extensive advice and specific recommendations for securing jobs with the Federal Government. Send \$4.00 to: The Washington Consultants, Dept. 23, P.O. Box 39094 Washington, D.C. 20016

RESULTS ORIENTED SENIOR COMPUTER PROGRAMMERS & PROGRAMMERS

Our company is seeking professionals to produce third generation Honeywell based systems. We require a desire to develop a duplicate system, with random access and direct communication, in a short period of time. A solid background in systems and the ability to learn the medical insurance field.

Management Required.

Management Required

BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP
WANTED IBM 360's <p>All models and components... Prompt replies to your offerings... Call collect or write:</p> <p>gsm</p>	FOR SALE <p>Burroughs B-280 Computer 4-8211 Tape Drives 10 used 1-8212 Card Reader 800 CPM 1-8204 Card Punch 300 CPM 1-8141 P.T. Reader 1000 CPM 1-8221 Printer 700 CPM Available Feb. 1, 1972 - Second hand Accepted through Jan. 31, 1972 Contact: Dr. Leon Engelbert, (513) 684-8981</p>	For Sale or Lease UNIVAC <p>8K 9200 Card System 8K 9300 Card System (with 1001)</p>	360/65 CORE FOR SALE <p>One 2365-2 Core Computer. Sale. February 1972 delivery. \$200,000. Lease also available.</p> <p>IPS INFORMATION PROCESSING SYSTEMS, INC. 12011 871-4200 467 Sylvan Avenue Englewood Cliffs, N.J. 07632</p>	Used Equipment for Sale: FRIEDEN #7102 <p>Date Communication Terminal Wiring: Receptacle, ASCII coding, Edge card read/punch, Paper tape read/write, Parity check feature, etc. included.</p> <p>Applications: Computer time sharing Interactive programming On-line programming On-line and off-line document entry/sets Text editing Computer generated instruction</p> <p>AMPEX Model TM-7211 Synchronous Magnetic Tape Drive 7 Track Read/Write/Erase/Heads Semi-conductor integrated circuit Power: 550/800W, 45.150V, used less than 4 months. IBM Compatible. Price: \$1,200.00 (617) 558-6100 Ext. 358</p>
<p>(3) IBM 2311 Disk Drives Ready for Shipping For Sale OR Lease</p> <p>*** D.P. Equipment Marketing Corp 260 W. Broadway, R. 7377 Ext. 1 Call Collect (212) 925-7777 Ext. 1</p>	<p>360/50 I (512K) FOR SALE BY OWNER AVAILABLE EARLY 1972</p> <p>Write CW Box 3540 90 Austin Street Newton, Mass. 02160</p>	<p>CPC systems Computer Property Corp. Exclusive Agent: GEM</p> <p>General Equity Management 112 Oak Drive Upper Saddle River New Jersey 07458 (201) 825-1505</p>	<p>THE HALSEY CORPORATION</p> <p>wants to buy complete 360/20 D02 System.</p> <p>THE HALSEY CORPORATION</p> <p>1367 Central Avenue Midwest City, Okla. 73142 (513) 424-1897</p>	<p>BUY-SELL-LEASE SUB LEASE</p> <p>IBM COMPUTER SYSTEMS & UNIT RECORD EQUIPMENT</p> <p>360/20 30 days 50% savings 360/20 Immediate 50% savings 360/20 60 days 35% savings 360/65 Immediate 35% savings 370/65 370/65 370/65 etc. available at lowest rates.</p> <p>THOMAS COMPUTER CORP. 625 N. Michigan-Suite 500 Chicago, Ill. 60611 (312) 944-1401</p>
<p>DATASERV equipment, inc. BUY-SELL-LEASE Systems & Components Unit Record Equipment 083 Sorters (\$2,800.00) 083 Printers (\$2,800.00) 1092 P.T. (\$27,000.00) 1092 V.T. (\$27,000.00) O (1092) with 1012-7 Available Feb. 1, 1972</p> <p>1133-1 Multiple Ext. Enc. 1133-2 1092-1 1402-7 Printer 1402-7 V.T. 407-A1 Accounting Machine 5000-A1 546-A1 546-A2 546-A3 546-A4 546-A5 546-A6 546-A7 546-A8 546-A9 546-A10</p>	<p>WANTED TO BUY 360/30 F Complete System Including 1051-1052 28211-X - 140311 - 2540</p> <p>Call or Write C.A.C. P.O. Box 29116 Atlanta, Georgia 30329 (404) 458-4428</p>	<p>FOR SALE 360/20 Card or Disk</p> <p>Write: CW Box 3538 60 Austin Street Newton, Mass. 02160</p>	<p>360/40H (256K) CPU For sale or lease by owner</p> <p>Two channels Direct control 1401 compatibility December delivery</p>	<p>WANTED 2040-G-H 2314 Mdl. 1 or A1 1403 N1, 2540, 2821 1092 V.T. - 2540 2803 Mdl. 1</p> <p>Bids accepted on any or all CW Box 3539 60 Austin St. Newton, Mass. 02160</p>
<p>WANTED TO BUY:</p> <p>IBM 2365 Processor Storage - Model 2 (264K), 60 cycle, 200-230 voits, domestic model still under IBM Maintenance Agreement, for use with 360/65 or 360/20 system. Price, delivery, payment and price, location, date available for shipment, year of initial purchase and IBM model number.</p> <p>Write: CW Box 3540 60 Austin Street Newton, Mass. 02160</p>	<p>FOR SALE 360/20 Card or Disk</p> <p>Write: CW Box 3538 60 Austin Street Newton, Mass. 02160</p>	<p>LOUISIANA NATIONAL BANK (504) 389-4204</p>	<p>UNIVAC 9200</p> <p>For sale or for lease Available in July 1972 8K Card System with read punch feature, selective stacker and 120 print positions Maintained under UNIVAC maintenance agreement.</p> <p>Write CW Box 3546 60 Austin Street Newton, Mass. 02160</p>	<p>TOP CASH PRICES PAID FOR</p> <p>IBM Type 026 and 029 Key Punches also 059 Verifiers and other Unit Record Machines Wash. up anywhere in the World. Call Collect (313) 584-9797</p>
<p>BUY-SELL-LEASE IBM COMPUTERS - U/R EQUIPMENT</p> <p>WANTED</p> <p>360/20 1130</p> <p>Econocom DIVISION OF COOK INDUSTRIES P.O. Box 18002 2221 DEMOCRAT ROAD • SUITE 135 MEMPHIS, Tenn. 38114 PHONE (901) 396-8600</p>	<p>FOR SALE</p> <p>402, 602, 514, 082 (2) 2311/1 Burroughs 65000</p> <p>CONTACT: KEN BOULON JOHN FERGUSON</p>	<p>FOR SALE</p> <p>IBM 2311-1 Disk Drives Under M/A Available Immediately</p> <p>REM Computers, Inc. 200 Atlantic Avenue Manasquan, N.J. 08736 (201) 223-6550</p>	<p>FOR SALE</p> <p>1642 2 use CPU 1442 Rdr/Pch 1403 2540 2621 Controller 2 - 1210 1403 Disk Drives PRICE: \$80,000 Memorex Disk Immax available \$5,000</p>	<p>For Sale or Swap</p> <p>RCA Spectra 70-46 Medium Sized Computer Complete Configuration or Parts Available For Sale or Swap CW Box 3547 60 Austin Street Newton, Mass. 02160</p>
<p>FOR SALE</p> <p>1440 Disk System Available March/April 1972 1441 A3 4K Processor 1442-02 1443-02 Under IBM Maintenance Available With Banking Software Contact Owner at: CW Box 3544 60 Austin Street Newton, Mass. 02160</p>	<p>FOR SALE</p> <p>1447-02 (3) 1311-Disks</p>	<p>COMPLETE 360/30 DISK SYSTEM</p> <p>1642 2 use CPU 1442 Rdr/Pch 1403 2540 2621 Controller 2 - 1210 1403 Disk Drives PRICE: \$80,000 Memorex Disk Immax available \$5,000</p>	<p>FOR THE Best Buy in 360's Call: (312) 295-2030 or (404) 451-1886 Frank Sylvester 222 East Wisconsin Avenue Lake Forest, Ill. 60045 Atlanta, Ga. 30329</p>	<p>Sale/Lease</p> <p>2401 - Model XI - Immediate Delivery 2040 G (128K) 2040 GF (196K) 2030 F, 1403 N1, 2821-1, 2540-1 *****</p> <p>2040 Core G to F - 2030 Core E to F</p>
<p>tbi</p>	<p>3</p>	<p>3</p>	<p>3</p>	<p>SPECIALISTS IN THE PLACEMENT OF PREOWNED 360 EQUIP.</p> <p>360 LEASE</p> <p>COMDISCO, INC. 2209 E. Devon Ave Skokie, Ill. 60051 (312) 297-3648</p>

computer industry

a Computerworld news section about the nation's fastest growing industry

January 19, 1972

Page 25

CI Notes

IBM Realigns DP Operations

ARMONK, N.Y. — IBM has realigned its Data Processing Group into two operating groups — one for marketing and services, the other for development and manufacturing.

The group responsible for the company's data processing marketing and services will include the data processing, field engineering and advanced systems development groups. It will be headed by Daren R. McKay, senior vice-president and group executive. McKay was a member of the company's management committee.

The development and manufacturing group, which is responsible for the company's worldwide computer products line, will include the components, general systems, systems development and systems manufacturing divisions. It will be headed by John R. Opel, senior vice-president and group executive, who was a member of the management committee.

3330 for 360 Expected Soon

NEW YORK — A 3330-like disk system that can be used with the larger models of the IBM 360 line will be announced within a month, sources said here last week.

While almost all of the independent peripheral manufacturers are said to be working on such devices, at least one has a prototype up and working, the sources said, and will announce it soon.

The sources also said that there should be a fallout in the independent disk market, winnowing the number of firms in the market from as many as three when deliveries of the 3330-compatible drives begin by the independent manufacturers.

Controls May Aid Simulation

NEW YORK — Wage-price controls will be beneficial to computer simulation during 1972, as firms will increase prices to reflect the cost of living. They've come to wage-price boards, according to Jackson S. Gouraud, president of On-Line Decisions, Inc.

In proving its cases for price increases, management must be convinced that increases are justified, but demonstrate they will not result in an increase in pretax profit margin. To do this, firms will have to project productivity changes, he said.

"The increasing use of computer power will result in programming efficiencies during the year ahead. Moreover, the increased use of interactive models will result in lower time-sharing costs," he said.

Supershorts

Singer's Fribolin Division has changed its name to Business Machines Division of The Singer Co. —

Orders totalling approximately \$1 million for computer output microfilm (COM) systems received by California Computer Products, Inc., in December indicates that this previously dormant segment of the computer graphics business may achieve a 22% per year growth rate through 1975, according to Lester L. Kilpatrick, Calcomp president.

Second Industry Forecast

Communications to Pace DP Growth

PHILADELPHIA — Faced by increases in data communications, the computer industry will resume its formerly high levels of growth, according to Auerbach Corp. here.

Auerbach is the second major research firm to report on future directions of the computer industry, and its conclusions pretty well match those reported by International Data Corp. [CW, Jan. 12], in that both firms see the computer industry resuming a high level of growth.

The computer industry will enjoy

sustained growth throughout the remainder of this decade, Isaac L. Auerbach, president said, but an increasing

dependence on foreign markets, and a general reorientation to the market will be required to realize this success.

"Slowly Lower"

"Despite unfavorable economic conditions, diminished market share, and a general maturing of the industry, future growth rates of the computer industry will be only slightly lower than those of recent years," Auerbach said.

"There will be a shift in emphasis from

technological changes to the development of integrated systems in which hardware and software are accorded equal status in the solution of a user's specific problems.

"In addition, users of computers have become more sophisticated and are more aware of the critical impact of their computer operations on the successful functioning of their daily business operations. As a result the user is no longer content to take whatever the computer manufacturer offers. They are beginning to know how computers can best be applied to their needs and are demanding a new responsiveness from suppliers," he said.

"Advances in data communication technology will be a major stimulus to the expansion of the computer industry in the U.S., virtually setting the pace for the development of the industry during the 1970s," Auerbach said.

Computer systems will emerge with the highest growth rate during the next five years, an average rate of 22% per year in gross shipments and 21% per year in installed base, the firm said.

Medium computer systems will have the second highest growth rate, mainly be-

cause of growth in the foreign market. The installed base of these computer systems is expected to grow at the rate of 17% per year. By contrast, medium computer systems in the U.S. will grow at a rate of only 12%, indicating that a modest level of market saturation now exists.

Large computer systems will enjoy the second highest growth in the U.S., about 14% per year, due mainly to the trend toward on-line data communications systems. In terms of dollars, the installed base of large computer systems worldwide is expected to increase from \$7.3 billion in 1970 to \$17.7 billion in 1975.

Extra-large computer systems will experience the lowest growth rate in the worldwide installed base, averaging 13% yearly. Demand for extra-large computer systems will be stimulated by large sophisticated data base management systems which will begin to attain operational status and wider acceptance during the 1970s.

Data communications growth is best characterized by Auerbach as the fact that the installed computer base possessing data communications capability will increase from 20% in 1970 to 50% in 1976.

While the computer industry is maturing, it is still in its infancy on the technical side of computer science as an area of the industry still in infancy.

"The computer field still lacks a scientific base," Auerbach said, "and without such a base the development of a more extensive theory of data processing is impossible. And such a theory is the only sure means of measuring the efficiency of an EDP system and of knowing how close to the limit a given computer system has come. To do this the EDP equivalents of physical quantities and properties must be identified."

"Now that the industry is approaching maturity it is using and developing more and more complex application packages, the long-deferred task of coming to grips with the properties of information systems has become acute. We may not see the full development of the required theoretical structures during the 1970s," Auerbach said, "but I believe we will at least see a strong beginning."

Caravan Highlights Terminals

NEWTON, Mass. — Terminals and data entry equipment will be the major features at the upcoming Computer Caravan, which will travel to nine cities in 10 weeks under the sponsorship of Computerworld.

At the same time, almost every other segment of the computer industry will be represented on the exhibit floor of the Computerworld Users Forum and Exposition, which will begin a cross-country trip with a meeting in Boston Feb. 22-24.

"Almost all of the major data entry manufacturers" have already signed up for the show, which is still taking booth reservations, according to Charles Amus, general manager for the Caravan.

In addition, he said that firms representing the minicomputer area will also be prominent on the exhibit floor, with such companies as Lockheed Electronics, Hewlett-Packard, Varian Data Machines,

Intertech and Texas Instruments planning to show their wares to the more than 25,000 expected visitors.

Several firms are also taking advantage of a new idea to be offered in conjunction with the Caravan, Amus said. Firms will be allowed, he said, to rent meeting rooms to put on presentations to interested users, away from the convention floor.

Under the arrangement, for example, a firm could give a short tutorial on how to purchase packaged software or how to best select a data entry system or minicomputer, he said.

Besides the Caravan will travel to New York City, Washington, D.C., Atlanta, Dallas, Los Angeles, San Francisco, Chicago and Detroit. More than 85% of the computer users in the U.S. are within two hours of one of the sites, Amus said.

CHECK HERE TO ENTER YOUR SUBSCRIPTION

1 year — \$9* New subscription

Payment enclosed Change of address

Bill me *\$19 a year in Canada; Airmail to Western Europe and Japan, \$15 a year; Other foreign rates on request.

ATTACH LABEL HERE for address change or inquiry. The code line at top may not mean much to you, but it is the only way we have of identifying your label. If you have any trouble reading, duplicate copies, please send both issues. Please tell us how many weeks before you want to move. List your address below and include the current mailing label or your old address.

First Initial Middle Initial Surname

Your Title

Company Name

Send to: Address

City

State Zip Code

Address shown is: Business Home

 COMPUTERWORLD

COMPUTERWORLD • Circulation Department • 797 Washington Street • Newton, Mass. 02160

Check here if you do not wish to receive promotional mail from Computerworld.

Check here for one number in each category.

VO-1 Industrial

21 Mining/Construction

22 Manufacturing

23 Wholesale/Retail

24 Transportation/Trade

25 Mechanical Devices

26 Chemicals

27 Utilities/Comm.

28 Manufacturing

29 Wholesale/Retail

30 Transportation/Trade

31 Warehousing

32 Manufacturing

33 Computer Services (less

cost CPU)

34 Medical

35 Legal

36 Accounting/Statistical

37 Govt./Local Govt.

38 Education/Training

39 Publishing

40 Advertising

41 Consulting

42 Advertising/Marketing

43 Librarian/Educator

44 Other

YOUR FUNCTION

1 Operational Manager

2 Executive/Marketing

3 Computer Professional

4 Financial

5 CPA/Accountant

6 Consultant

7 Advertising/Marketing

8 Librarian/Educator

9 Other

New Marketing, Minis Mark GA's Entry Into OEM

NEW YORK — General Automation (GA) has launched a major offensive into OEM mini markets with the introduction of nine machines and a new sales policy designed to provide OEM purchasers with "greater freedom in the development, test and shipment of their own products," according to the company.

Six machines are evolved from the firm's SPC-16 family, and three from the SPC-12 family. Quantity prices start under \$2,000.

The new marketing policies "represent an initial step toward providing more latitude to OEM buyers while encouraging them to experiment with new

applications," stated Jay L. Karp, director of sales.

The sliding commitment delivery schedule provides up to 12-month delivery leeway for OEM customers, and is designed to eliminate "chargebacks" by the firm for buyers who require to accept products at the first year's contracted order level.

Under the GA plan, a buyer must take delivery of the first systems on schedule at the start-up phase. But he can then delay the beginning of his contract for production until 12 months beyond the date of the first unit shipment without any chargebacks.

Under its selective rental plan, GA offers a number of computers, including all necessary peripherals, controllers and software, on a 30-day cancellation

basic. The policy is designed to encourage development of new OEM applications, by eliminating capital outlays during the project prove-out stage.

The double warranty policy provides a 90-day warranty on all products which the OEM can pass along to the end user.

Under its new discount schedule, GA will allow up to 40% off its new product lines.

Two Configurations

The SPC-10 minis are available in two configurations. Models 16/40, 60 and 80, designed for the middle range, have a main memory of 4K expandable to 16K, a Teletype control unit, and an "integral I/O package."

Single unit prices are \$5,550, \$6,550 and \$8,550 respectively.

Models 16/45, 65 and 85 can be purchased in small modules on a "bare bones" basis, offering a minimum 4K processor with all other features optional. Alternatively, the units can be expanded to 65K, having up to one or more 64 peripherals. Unit prices for the 16/45, 65 and 85 start at \$3,950, \$4,950 and \$6,950 respectively.

Models 12/10, 20 and 30 are semi-contained control systems with up to 16K memory and software, and a Teletype controller integrated into their modular design. Unit prices are \$2,980 for the 12/10, \$3,480 for the 12/20 and \$3,980 for the 12/30.

Deliveries are slated to begin in March, with 60-day delivery initially. The firm is at 1035 S. East St., Anaheim, Calif., 92805.

Cogar Sets Financing With Bank, Singer

WAPPINGERS FALLS, N.Y. — Cogar Corp. has announced a financing plan that could bring the financially troubled firm back to profitability through the sale of stock and bank loans.

Last year the firm lost \$3.3 million on sales of \$1.2 million, up from a loss of \$3.5 million in sales of \$152,161 a year earlier. The firm also has suspended marketing of its System 4 system due to financial problems.

Under the new plan, Cogar will sell 250,000 shares of stock at \$5 per share, and if that offering is successful it could obtain loans of up to \$2.3 million. Local investors in the stock will have to make a minimum investment of \$10,000 and will have to agree to hold the stock for at least one year.

If the sale is successful, Chemical Bank will lend Cogar up to \$1.8 million. The bank has the option to lend Cogar Co. up to \$1.2 million on the loan, and if it does, the bank would then lend Cogar an additional \$500,000.

In addition, Cogar would be prohibited from taking any new, special business without the consent of either Singer, Chemical or the Bank of the Commonwealth and Trust Co., which has also invested heavily in the firm.

Honeywell Predicts Rise In '72 Keyplex Shipments

WALTHAM, Mass. — Honeywell Inc. reported that at year-end installations of its Keyplex systems number over 100 worldwide with "very high" backlog levels going into 1972.

Edward C. Lund, vice-president and general manager of the firm's North American Operations, projected "significant" increases in both net bookings and shipments for 1972.

The increased shipments will result, in part, from efficiencies realized by the transfer of production work from San Diego to Massachusetts slated for completion this spring, he said. An estimated 60 keyplex units will be transferred to the Boston area beginning this month.

Lund said bookings for the key-to-disk Keyplex systems "will continue to increase in North America and particularly in European markets such as the United Kingdom, France, Germany, Italy and Spain, where Keyplex has been successful."

Keyplex deliveries began in February last year from San Diego. Shipments will begin from Massachusetts plants sometime during the second quarter, he said. No interruption in delivery schedule will result from the production shift, he added.

POTTER Solid State Memories for your 360 give you

- up to double the storage capacity
- higher reliability
- low rental costs
- less maintenance and downtime
- lower power requirements
- lower space requirements



POTTER

A lot more than less expensive.





Who's winning in Teletype- compatible CRT's?

Hazeltine 2000, the frontrunner. Because in CRT terminals too, boldness will tell.

Hazeltine Corporation
Computer Peripheral Equipment
Greenbaum, N.Y. 11740

EAST: NEW YORK (212) 586-1920 □ BOSTON (617) 586-8900
PHILADELPHIA (215) 616-3488 □ CHICAGO (312) 986-1440 □
MIDWEST: MINNEAPOLIS (612) 854-5585 □ DETROIT (313) 355-8100 □
CLEVELAND (216) 752-1038 □ ALEXANDRIA (301) 335-3810 □ ST. LOUIS (314) 862-7281 □

SOUTH: DALLAS (214) 933-7778 □ HOUSTON (713) 288-8017 □ LOS ANGELES (415) 366-0888 □ DENVER (303) 419-5800 □
WEST: SAN FRANCISCO (415) 366-0888 □

Circle 444 on Reader Service Card